

The opinion in support of the decision being entered today
is *not* binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT LEWIS BIXLER JR.
and SUSAN JANE GELDERBLOOM

Appeal 2007-1895
Application 10/719,489
Technology Center 1700

Decided: July 25, 2007

Before CHUNG K. PAK, CHARLES F. WARREN, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 1 through 16 in the Office action mailed January 13, 2006. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We affirm the decision of the Primary Examiner.

Claim 1 illustrates Appellants' invention of an integrated process for compounding a catalyst containing silicone rubber composition, and is representative of the claims on appeal:

1. An integrated process for compounding a catalyst containing silicone rubber composition comprising the steps of
 - A) blending a composition comprising:
 - i) 100 parts by weight of a high consistency polydiorganosiloxane,
 - ii) about 10 to 80 parts by weight of a treated or untreated reinforcing silica filler,
 - iii) about 10 to 45 weight percent, based on the weight of the reinforcing silica filler, of a treating agent for the reinforcing silica filler

and when said reinforcing filler is untreated

by introducing the filler into a mixer (1) and maintaining said filler in a highly turbulent, fluidized state at a temperature of from about 80°C to about 350°C, maintaining the temperature and the filler in the highly turbulent fluidized state while introducing the polydiorganosiloxane and subjecting the resulting mixture to a shearing force sufficient to achieve an average particle size of from 1 to 1000 microns thereby forming a flowable organopolysiloxane powder composition, and when required, introducing said treating agent into the mixer (1) prior to, during, or after addition of the polydiorganosiloxane,

B) directly transferring the flowable organopolysiloxane powder composition to a bulk solids cooling device (7) and facilitating accelerated bulk cooling thereof to a temperature below a temperature selected from the group consisting of (i) the decomposition temperature and (ii) the activation temperature of a catalyst added in step (D),

C) feeding the bulk cooled flowable organopolysiloxane powder composition to a massing apparatus (8) and massing the organopolysiloxane composition therein at a temperature selected from the group consisting of (i) below the decomposition temperature and (ii) the activation temperature of a catalyst added in step (D),

D) adding a catalytic amount of a catalyst to the organopolysiloxane composition either prior to, during, or after step (C) at a temperature selected from the group consisting of (i) below the decomposition temperature and (ii) the activation temperature of the catalyst.

The Examiner relies on the evidence in these references:

Bilgrien	US 5,153,238	Oct. 6, 1992
Boudreau	US 6,444,154 B1	Sep. 3, 2002

Appellants request review of the ground of rejection of claims 1 through 16 under 35 U.S.C. § 103(a) as unpatentable over Bilgrien in view of Boudreau (Br. 3; Answer 2-5).

Appellants separately argue claim 1 with the other claims standing or falling therewith (Br., e.g., 15-16). Thus, we decide this appeal based on claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

The Examiner finds Bilgrien discloses blending a polydiorgano-siloxane, a silica filler and a treating agent in a mixer to form a powder composition at a temperature of from 100-200°C, cooling the powder composition, and massing the powder composition to which has been added a catalyst, wherein the blending of the powder composition and catalyst and subsequently massing thereof are conducted at temperatures below about 40°C. The Examiner contends the steps meet the claimed process steps A, C, and D but not step B. Answer 2-3 and 4, citing Bilgrien, e.g., col. 7, l. 30. to col. 8, l. 2, col. 10, ll. 23-29, and Example 1. With respect to step B, the Examiner finds Bilgrien discloses that after the powder composition has been formed in the mixer, the powder composition is either cooled in the mixer with mixing to ensure uniformity or discharged from the mixer, and in either event, the composition is combined with the catalyst and massed (*id.* 3, citing Bilgrien, e.g., col. 9, ll. 20-30 and 42-59). The

Examiner determines from these teachings that “if the hot material is discharged it must be cooled before the next step,” and that “[d]ischarging such a material directly into a cooling device would expedite the cooling step.” The Examiner concludes one of ordinary skill in this art “would have found the use of a cooling device obvious since the working example shows a step of actively cooling the composition prior to milling.” *Id.* 4. The Examiner further contends, in this respect, Bilgrien “teaches that continuing mixing during cooling ensures uniformity of the final powder” such that “if the material is discharged hot,” the reference provides “motivation to continue mixing during cooling” (*id.* 4-5, citing Bilgrien, e.g., col. 9, ll. 25-27). The Examiner contends that any reduction in processing time is an obvious advantage since the discharge of a heated powder composition from the mixer and then cooling does not involve cooling all of the components of the mixer in cooling the composition (*id.* 6-7).

The Examiner further contends the difference between the claimed process and that of Bilgrien can be considered as continuous process vis-à-vis a batch process since the claimed mixing process “can continue because the transfer [of the powder composition] to a different device for cooling allows for a continuous process” (Answer 3). The Examiner finds Boudreau teaches a continuous process in which “[t]he mixing of the silica and siloxane is carried out in one mixer while subsequent cooling is carried out separately . . . [in] a different apparatus for cooling and a catalyst is subsequently added” (*id.* 3-4 and 7, citing Boudreau col. 5, ll. 5-20). The Examiner concludes one of ordinary skill in the art “would have known to adapt the batch process in [Bilgrien] such that it is a continuous process, i.e.

by transferring the mixture to a cooling apparatus rather than halting the mixing process (which requires heating) to initiate cooling,” and thus, “the difference between the example in [Bilgrien] and the instant claims [is] obvious” (*id.* 4). The Examiner finds the polysiloxane materials as claimed in claim 1 and as disclosed in Bilgrien and Boudreau overlap (*id.* 7).

Appellants argue that the claimed process is not the result of merely converting Bilgrien’s batch process into a continuous process on the basis that Boudreau evinces a continuous process was known in the art, contending that the facts of the present appeal are different than those in *In re Dilnot*, 319 F.2d 188, 193-94, 138 USPQ 248, 252 (CCPA 1963), and that Bilgrien and Boudreau have been improperly combined (Br. 10). Appellants contend that in *Dilnot*, the prior art gradually delivered a measured amount of a material as a batch into a mixture and the claim required “continuously introducing” the material, arguing “there was no criticality to continuously introducing the foam into the cementitious slurry” (Br. 11; Reply Br. 3-4). Thus, Appellants contend “the obviousness of ‘making continuous’ . . . is only meant to address the differences between performing an old step or steps all at once as opposed to extending the performance of those steps over time to make the process continuous, when such difference is not critical to the invention” (Br. 11; original emphasis omitted; Reply Br. 3-4). Appellants contend that appealed claim 1 does not “claim the same steps as disclosed in [Bilgrien] modified so as to make the process continuous . . . required to establish obviousness” under *Dilnot* because of the limitation “directly transferring the flowable organopolysiloxane powder composition to a bulk solids cooling device

and facilitating accelerated bulk cooling thereof" (Br. 12, citing claim 1; original emphasis omitted). Appellants contend "this limitation is clearly not disclosed in" Bilgrien and has the advantage, among others, of "substantially reducing processing time" where Bilgrien "discloses cooling the composition in the same mixer in which it is formed, and thus, the claimed limitation is not designed to make Bilgrien's process continuous (*id.*). Appellants further contend that claim 1 does not require either a continuous process or a batch process, and encompasses both kinds of processes (Reply Br. 3).

Appellants contend Boudreau is non-analogous art to the claimed invention and there is no motivation to one of ordinary skill in the art with knowledge of the problem confronted by Appellants but not of the claimed invention, to combine this reference with Bilgrien (Br. 13). Appellants contend that Boudreau does not satisfy either test for analogous art set forth in *In re Clay*, 966 F.2d 656, 658, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992), because the reference is from a different field of endeavor, that is, liquid silicone rubbers and not the claimed powdered silicone rubbers, and based on this difference, the reference would not have commended itself to the problem addressed by Appellants (Br. 13-15; Reply Br. 4-5). On this basis, Appellants further contend one of ordinary skill in the art would not have combined the references and further selected elements of the process for making a liquid composition in Boudreau for combination with Bilgrien's process for making a powder composition (Br. 15; Reply Br. 5-6).

The issue in this appeal is whether the Examiner has carried the burden of establishing a *prima facie* case of obviousness over the combined teachings of Bilgrien and Boudreau.

The plain language of claim 1 encompasses an integrated process comprising at least the specified four steps wherein in step A, at least the indicated composition comprising at least a high consistency polydiorganosiloxane, silica filler, and, optionally, a treating agent is blended in a mixer in a highly turbulent, fluidized state at a temperature ranging from about 80°C to about 350°C to form a flowable organopolysiloxane powder composition. In step B, the flowable organopolysiloxane powder composition at a temperature within said range is directly transferred to a bulk solids cooling device that facilitates accelerated bulk cooling of the composition to a temperature below a temperature selected from the group consisting of (i) the decomposition temperature and (ii) the activation temperature of a catalyst added in step D. The cooled flowable organopolysiloxane powder composition is massed in a massing apparatus in step C while step D requires adding a catalyst to the composition either prior to, during, or after step C. The bulk cooling device that facilitates cooling can include, among other things, jacketed mixers (Specification 7:1-11). The process is “integrated” in that the specified steps are followed as stated, and as Appellants point out, claim 1 encompasses both “continuous” and “batch” processes (Reply Br. 3).

We agree with the Examiner’s findings of fact from Bilgrien (*see above* pp. 3-5). For emphasis, we find this reference would have disclosed to one of ordinary skill in the art a process for compounding a catalyst

containing silicone rubber composition comprising forming a flowable organosiloxane powder composition by blending a high consistency or liquid polydiorganosiloxane and a filler to which a curing agent is added and the powder composition massed (Bilgrien, e.g., Abstract and col. 2, ll. 7-33). The blending step is performed in any mixer apparatus which applies shearing forces to reduce particle size at a temperature of greater than 100°C up to 200°C (*id.*, e.g., col. 2, ll. 22-28, col. 2, l. 37, to col. 3, l. 21, col. 6, l. 41, to col. 7, l. 6, and col. 7, ll. 31-66). “The blending of the powder with the curing agent, curing catalyst and subsequent massing of the powder composition are conducted at temperatures below about 40°C. to maximize the working time of the composition” (*id.* col. 9, l. 41, to col. 10, l. 30). Bilgrien discloses that subsequent to blending the powder composition,

either of two options are available. The first option includes heating of the reactor is discontinued while the plow and chopper blades are rotated until the temperature of the product decreases to 60 degrees or less. Continuation of mixing as the product cools ensures uniformity of the final powder. The cooled material then can be discharged from the mixer. The second option involves simply discharging the hot material from the mixer.

Id. col. 9, ll. 20-33. Bilgrien illustrates the first option in Example 1 in that after steam was circulated in the jacket of the mixer to maintain a chamber temperature of 140° to 145°C, “cooling water was circulated through the jacket of the mixer chamber and operation of the plow and chopper blades continued until the temperature of the material in the chamber reached 60°C” (*id.* col. 13, ll. 26-42). Bilgrien further illustrates in Examples 2 and 3 that after mixing, the powder composition in the mixer chamber was

“transferred to a container” or “discharged into a receiving container” (*id.*, col. 15, ll. 33-34, and col. 17, ll. 9-12). The viscosity of the polydiorganosiloxane materials is from about 1,000,000 to about 100,000,000 centipoise (*id.* col. 3, ll. 51-56).

We agree with the Examiner’s findings of fact from Boudreau (*see above* pp. 4-5) to which we add the following for emphasis. We find this reference would have disclosed to one of ordinary skill in the art a process for a process for compounding a catalyst containing silicone rubber composition comprising forming a liquid organosiloxane composition by blending a liquid polydiorganosiloxane and a filler in an extruder, transferring the composition to a cooler for cooling, and homogenizing the composition (Boudreau, e.g., Abstract, col. 1, ll. 53-63, col. 2, ll. 21-28). The composition is batched processed in the extruder at a temperature range of 160-210°C and the “[c]ooling . . . can be effected in a separate counter-rotating mixer, which can provide back-mixing and a high residence time to homogenize the material into a base,” after which a catalyst can be added (*id.*, e.g., col. 2, ll. 29-43, col. 2, l. 53, to col. 5, l. 18, Figs. 1 and 2, and Examples). The viscosity of the polydiorganosiloxane materials is from about 100 to about 2,000,000 centipoise (*id.* col. 3, ll. 1-4).

We determine the combined teachings of Bilgrien and Boudreau, the scope of which we determined above, provide convincing evidence supporting the Examiner’s case that the claimed invention encompassed by claim 1, as we interpreted this claim above, would have been *prima facie* obviousness of to one of ordinary skill in the silicone rubber compounding

arts familiar with the preparation of powder and liquid silicone rubber compositions containing a catalyst.

We agree with Appellants' analysis of *Dilnot* to the extent that the mere conclusory characterization of a claimed process as "continuous" and that of the reference process as "batch" does not per se establish a *prima facie* case of obviousness of the claimed process over the prior art within the meaning of § 103(a). It is well settled that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336, quoted with approval in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007). This is true where the difference between the claimed process and the prior art process is "continuous" and "batch." See, e.g., *In re Korpi*, 160 F.2d 564, 566, 73 USPQ 229, 230 (CCPA 1947) (claimed "continuous" alkylation process did not distinguish over prior art references disclosing continuous and batch alkylation processes), cited in *Dilnot*, 319 F.2d at 194, 138 USPQ at 252.

Thus, the Examiner must provide factual findings from the combined teachings of Bilgrien and Boudreau to support a conclusion that the claimed process encompassed by claim 1 would have been *prima facie* obvious to one of ordinary skill in this art over the applied references. Here, the Examiner correctly identifies the difference between the claimed process encompassed by claim 1 and the applied prior art is Bilgrien transfers the hot flowable organosiloxane powder composition to a container rather than

to a bulk solids cooling device as specified in step B of claim 1. We further agree with the Examiner's determination that Bilgrien's step of cooling the hot flowable organosiloxane powder composition with mixing in the mixer to provide uniformity to the composition prior to the steps of catalyst addition and massing would have motivated one of ordinary skill in this art to cool, with mixing, the hot flowable organosiloxane powder composition transferred from the mixer prior to the same steps. Indeed, the Examiner properly further supports this position with the findings of the differences in the temperature of the hot flowable organosiloxane powder composition at the end of the blending step and the temperature of the composition when the catalyst is added and the composition massed disclosed by Bilgrien. The Examiner finds Boudreau would have disclosed the use of a jacketed mixer to cool a similar hot liquid organosiloxane composition transferred to the cooler from an extruder used to blend the composition prior to the addition of a catalyst thereto. Thus, we agree with the Examiner's conclusion that one of ordinary skill in this art would have been led by the combined teachings of the references to use the jacketed cooler of Boudreau to cool the hot flowable organosiloxane powder composition transferred from the mixer prior to the steps of catalyst addition and massing in the reasonable expectation of achieving the results taught by Bilgrien for the process disclosed therein.

Accordingly, on this factual record, we agree with the Examiner that one of ordinary skill in this art routinely following the combined teachings of Bilgrien and Boudreau would have reasonably arrived at the claimed invention encompassed by claim 1, including all of the elements thereof

arranged as required therein, without recourse to Appellants' Specification. *See, e.g., In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art." (citations omitted)); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) ("The test for obviousness is not whether . . . the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.").

We cannot subscribe to Appellants' position that the references would not have been combined by one of ordinary skill in this art because the Boudreau is non-analogous art to the claimed invention and the disclosure of Bilgrien based solely on the difference of powder and liquid between otherwise related organosiloxane composition that contain the same kinds of ingredients. We agree with the Examiner that the range of polydiorganosiloxanes taught in each of Bilgrien and Boudreau overlap with respect to viscosity, and Appellants do not distinguish these materials from the "high consistency polydiorganosiloxanes" encompassed by claim 1. Indeed, on this record, one of ordinary skill in this art of compounding catalyst containing silicone rubber compositions would have considered the references to not only be in the same field of endeavor but also pertinent to the problem of cooling hot organosiloxane powder compositions discharged from the mixer which Appellants address. *See Clay*, 966 F.2d at 658,

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23 USPQ2d at 1060-61.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Bilgrien and Boudreau with Appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 16 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The Primary Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

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